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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/617,876	07/14/2003	Martin F. Bachmann	1700.0310001/BJD/SJE	4797

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EXAMINER	
MOSHER, MARY	

ART UNIT	PAPER NUMBER
1648	

DATE MAILED: 06/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/617,876	BACHMANN ET AL.	
	Examiner	Art Unit	
	Mary E. Mosher, Ph.D.	1648	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11/14/03, 11/19/03, 1/26/04*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-51* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-51* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *11/14/03, 1/26/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

Claims 1-12, 16-28, 30, 41, 42, 46-51 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 7, 12, 25, 26, 27, 28, 30, 50 are indefinite in reciting "a mutein" without further limitation. As defined in specification paragraph 0063, the term "mutein" refers to a protein differing by any number of amino acid additions, substitutions, and/or deletions, thereby encompassing an infinite variety of polypeptides.

In claims 1, 3-6, 12, 47, does "an amino acid sequence as set forth in SEQ ID NO:1..." mean the whole amino acid sequence SEQ ID NO:1, is "an amino acid sequence" meant to encompass any fragmentary sequence?

Claims 3-5, 8-10 are indefinite in reciting "a conservative substitution." Specification paragraph 0063 gives examples of conservative substitutions, but does not set definite metes and bounds. Therefore this term is indefinite.

A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a

question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 3 recites the broad recitation "at least one amino acid residue", and the claim also recites "preferably three amino acid residues," "more preferably two amino acid residues," "even more preferably one amino acid residue," "preferably...a conservative substitution," which are all narrower statements of the range/limitation. Claims 4, 5, 8-11, 16-20, 22 have a similar problem.

In claim 41, the preamble term "vaccine" is different in scope from the "immunologically effective" term in the body of the claim. Which is intended, a protective vaccine or an immunogenic composition?

These problems affect the dependent claims.

Claims 1-5, 7-46, 48-51 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The claims involve a genus of virus-like particles or virus particles. The specification shows reduction to practice of virus-like particles with the sequence SEQ ID NO:1. The specification also shows reduction to practice of a protein with SEQ ID NO:3, where proline at position 5 is changed to

threonine, and discusses additional variations in the sequence such as removal of cysteine(s) and alteration of lysine(s). However, there is no showing that any of the variants, even SEQ ID NO:3, actually assembles into a virus or virus-like particle. As discussed in Klovins et al (Journal of General Virology 83:1523-1533, 2002), there is no homology between the AP205 coat protein (SEQ ID NO:1) and any other phage coat protein. The specification contains no teachings regarding the minimal structural requirements for AP205 muteins to assemble into particles, and the absence of homology to known coat proteins precludes any prediction of essential or nonessential residues or regions. Considering the absence of teachings, the unpredictable effect of amino acid changes on assembly into particles, the absence of knowledge in the prior art, and the single species reduced to practice, it is concluded that the specification reasonably conveys possession only of VLPs or virus particles comprising SEQ ID NO:1. This is a "written description" rejection, not an enablement rejection.

Claims 6 and 47 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claims 6 and 47 are drawn to the protein of SEQ ID NO:3 and a nucleic acid which encodes it. The "how-to-use" teachings in the specification all involve formation of a particle. However, alteration of coat protein structure has unpredictable effects upon the ability to form a particle, and there is no evidence on this record that SEQ ID NO:3 is able to form a particle. If it cannot, then the specification does not teach any method of

use for the protein or its coding sequence. Considering the limited teachings in the specification, the absence of a working example, the absence of knowledge in the prior art, and the unpredictable effects of amino acid alteration, it is concluded that undue experimentation would be required to use the invention as claimed.

Claim Objections

Applicant is advised that should claim 1 be found allowable, claims 3, 7, 8 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k). Claims 1, 3, 7, 8, are identical in scope, because there is no embodiment which is included in one of the claims but excluded from any of the others. By elaborating all possible types of amino acid alterations, claims 3 and 8 are no narrower in scope than the parent claims broadly reciting "mutein". Furthermore SEQ ID 1 constitutes a "mutein" of SEQ ID 3 and vice versa, so claims 3, 7, and 8 all encompass unmodified SEQ IDs 1 and 3.

Claims 50-51 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim must refer to other claims in the alternative only. See MPEP § 608.01(n). In the interest of compact prosecution, the claims have been treated as if they did not recite "according to claim 1."

Specification

The disclosure is objected to because of the following informalities: The Brief Description of the Drawings describes Figures 1A-B, but is inaccurate because Figure 1 goes up to 1E.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-5, 7-10, 12-27, 29, 30, 40-46 are rejected under 35 U.S.C. 102(b) as being anticipated by Schiller et al WO 00/23955. Schiller teaches virus-like particles comprising a papillomavirus protein, and materials fused or coupled to the particle in a repetitive array. In the instant specification, "mutein" is defined so broadly as to encompass any particle-forming protein, and AP205 virus-like particles" are defined as encompassing any "mutein." See paragraphs 0047 and 0063 in the instant specification for the broad definition of "AP205 VLP" and "mutein." Since SEQ ID NO:1 could be converted to a papillomavirus sequence by altering more than one amino acid by addition, substitution, and deletion, the papillomavirus VLP of Schiller constitutes a "mutein" and an "AP205 VLP." Therefore the reference meets each and every claim limitation.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

The following 9 provisional double patenting rejections are all necessitated by the broad scope of the claims. In the following 9 rejections, the instant claims, encompassing any virus-like particle, are not patentably distinct from any other application claims involving virus-like particles with the same or similar antigen attached.

Claims 1-5, 7-46, 48-51 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 86, 90-112 of copending Application No.09/848616.

Claim 30 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-53 of copending Application No. 10/050898.

Claims 1-5, 7-46, 48-51 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 220-361 of copending Application No. 10/050902.

Claims 1-5, 7-46, 48-51 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-194 of copending Application No. 10/243739.

Claim 30 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-49 of copending Application No. 10/264267.

Claim 30 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-98 of copending Application No.10/289454.

Claims 30 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-75 of copending Application No. 10/289456.

Claims 32-35 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 116-153 of copending Application No. 10/622064.

Claims 25, 26, 28 provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 50-97 of copending Application No. 10/733852.

These are provisional obviousness-type double patenting rejections because the conflicting claims have not in fact been patented.

The following 5 provisional double patenting rejections are directed specifically to copending applications which claim AP205 particles, and the instant claims which claim the same or similar antigen attached to the particle.

Claims 32-35 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 4, 9, 12, 16 of copending Application No. 10/622,064.

Claim 30 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 6, 9, 30, 33, 53 of copending Application No. 10/289456.

Claim 30 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 6, 8, 30, 32, 53, 83, 85 of copending Application No. 10/289454.

Claims 1-5, 7-46, 48-51 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 4, 24, 26, 55, 81, 101, 103, 138 of copending Application No. 10/243739.

Claim 30 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 4, 9, 11 of copending Application No. 10/264267.

These are provisional obviousness-type double patenting rejections because the conflicting claims have not in fact been patented.

Allowable Subject Matter

Claims directed to a virus-like particle comprising SEQ ID NO:1, a composition comprising a hapten or antigen bound to the particle, and an expression vector encoding SEQ ID NO:1, would be allowable (subject to resolution of double patenting issues). Klovins et al (Journal of General Virology 83:1523-1533, 2002) is cited as the closest prior art. Klovins teaches the genomic sequence of bacteriophage AP205, including the coat protein coding sequence. However, Klovins is concerned with the phylogenetics of bacteriophages and does not teach or suggest a virus-like particle comprising the coat protein, or provide a reasonable expectation of success that such a particle would assemble in a recombinant host in the absence of the rest of the phage. Klovins does not suggest such a particle as a platform for presenting haptens and antigens, or provide any motivation to make an expression vector to express the coat protein. The prior art teaching virus-like particles as antigen carriers provides no particular motivation to look to a phage like AP205 which infects Acinetobacter bacteria, absent impermissible hindsight.

Information Disclosure Statement

In the IDS's filed 11/14/2003, the Genbank and Swissprot reports (AR95-AT127, AR132)) have not been considered, because the disclosure of strings of nucleotides or amino acids cannot be given any meaningful consideration in the absence of an alignment or other indication of relationship of the sequence to the claimed invention.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mary E. Mosher, Ph.D. whose telephone number is 571-272-0906. The examiner can normally be reached on M-T and alternate F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Housel can be reached on 571-272-0902. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

6/21/05

MARY E. MOSHER, PH.D.
PRIMARY EXAMINER